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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
REDDY, KARUNA P	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/586,134	MICHL ET AL.	
	Examiner	Art Unit	
	KARUNA P. REDDY	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10,11,13-18 and 20-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-11, 13-18 and 20-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed 4/29/2009. Claims 1-9, 12 and 19 are cancelled; claims 10, 15 and 25 are amended. Accordingly, claims 10-11, 13-18 and 20-27 are currently pending in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. Claims 10-11, 13-18, 20-25 and 27 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 10, 23 and 25 recite either "wherein the thermally polymerizable mixture comprises"; and/or "wherein the thermally polymerizable mixture does not comprise monomers other than the multifunctional macromonomer." and/or "thermally polymerizable consists essentially of". There is no support for these recitations in the originally filed disclosure for the following reasons:

Specific support for "thermally polymerizable mixture consisting of a multifunctional macromonomer comprising one or more free-radically polymerizable double bonds and a polymerization initiator" exists in originally filed claims of 7/17/2006. Specification also teaches that the thermally polymerizable mixtures consisting of

multifunctional macromonomer and thermal polymerization initiators may contain inhibitors and at least one customary additive in the customary amounts, for example emulsifiers, pigments, fillers, curing agents, antimigration agents, plasticizers, biocides, dyes, antioxidants and waxes.

Firstly, amendment to change the scope of present claims from "consisting of" to "comprising" by the recitation "wherein the thermally polymerizable mixture comprises" opens the scope of present claims to additional components, for example, other monomers and polymers not disclosed in originally filed claims or specification and thus fails to comply with the written description requirement. Secondly, court held that any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) and *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Hence, the recitation "wherein the thermally polymerizable mixture does not comprise monomers other than the multifunctional macromonomer." is not supported by the originally filed disclosure. Finally, amendment from "consisting of" to "consists essentially of" opens the scope of claims to those components which do not effect the basic and novel characteristics of the claimed invention. There is no teaching in the originally filed instant disclosure that the customary additives taught do not affect the basic and novel characteristics of the claimed invention. For example, fillers affect strength of the article produced by the

process of instant invention. Hence, it is the examiner's position that the recitation "thermally polymerizable consists essentially of" is not supported by the originally filed disclosure.

Claims 11, 13-18, 20-24 and 27 are subsumed by this rejection because of their dependence either directly or indirectly on claims 10, 23 or 25.

Claim Rejections - 35 USC § 103

4. Claims 10-11, 13-14 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213).

Arkens et al disclose aqueous coating composition containing a polyacid and a polyol. The composition may be used as a binder for heat resistant nonwovens such as fiber glass (abstract). The addition polymer must contain at least two carboxylic acid groups such as (meth)acrylic acid, anhydride groups or salts thereof (column 4, lines 1-2) and read on one or more free radically polymerizable groups of instant claims. The addition polymer containing at least two carboxylic acid groups may have a molecular weight preferably from about 10,000 to 100,000 (column 4, lines 28-29) and reads on multifunctional macromonomer of instant claims. The polymerization reaction may be initiated by using the thermal decomposition of an initiator to generate free radicals to effect polymerization (column 5, lines 6-11). In one embodiment the carboxyl or anhydride-containing additional polymer, the polyol and the phosphorus-containing accelerator may be present in the same addition polymer (column 7, lines 5-9) and reads on polymerizable multifunctional macromonomer, comprising at least one free-radically polymerizable group, of instant claims and polymerizable mixture does not contain other

monomers. The curable aqueous composition may be used as a binder for heat resistant nonwoven fabrics such as certain polyester fibers, rayon fibers and glass fibers (column 8, lines 24-29) and reads on binding the fibrous and/or granular substrates. The water-borne formaldehyde-free composition after it is applied to a nonwoven is heated to affect drying and curing (column 8, lines 42-43). The heat resistant nonwovens may be used for applications such as insulation batts or rolls, as reinforcement scrim in cementitious and non-cementitious coatings for masonry (column 8, lines 61-67). The binder is used in amounts of 28% by weight based on the weight of glass i.e. glass fiber (column 10, lines 13-14). It is the examiner's position that coating of the curable composition consisting of binder when cured would bind the fibrous and/or granular substrates such as polyester fibers, rayon fibers and glass fibers.

Arkens et al fails to disclose contacting fibrous and/or granular substrates with polymerizable mixture; and amount of thermally polymerizable mixture used in the impregnation of fibrous and/or granular substrate.

However, Arkens et al teach in the general disclosure use of curable aqueous composition as a binder for heat resistant nonwoven fabrics such as certain polyester fibers, rayon fibers and glass fibers; and polymerization of reaction mixture to form the addition polymer. Instant invention also discloses that it is known in the prior art to impregnate fiber materials with prepolymers and then complete addition polymerization. Therefore, it would have been obvious to coat/impregnate the substrate with polymerizable mixture of Arkens et al prior to complete polymerization, because it is well known from prior art that fiber materials can be impregnated with prepolymers and Arkens et al teach coating a substrate such as certain polyester fibers, rayon fibers and glass fibers with a binder material, as well as the polymerization of binder material and

one of ordinary skill in the art would expect polymerization to work after coating/impregnating the substrate with polymerizable mixture consisting of the prepolymer and polymerization initiator, absent evidence of unexpected results. Court held that selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946).

With respect to the amount of thermally polymerizable mixture used in impregnation of fibrous and/or granular substrate, it is the examiner's position that impregnation of substrate with thermally polymerizable mixture in amounts of from 2 to 35% by weight and 5 to 25% by weight is dependent on adhesion desired and the fibrous and/or granular nature of substrate and is within the scope of one skilled in the art, absent evidence of unexpected results.

5. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213) in view of Rockrath et al (US 6, 835, 420 B1).

The discussion with respect to Arkens et al in paragraph 4 above is incorporated herein by reference. Furthermore, the composition can comprise a polyacid containing at least two carboxylic acid groups or the salts thereof and a highly reactive polyol containing at least two hydroxyl groups wherein the ratio of the number of equivalents of said carboxylic groups, anhydride groups or salts thereof to the number of equivalents of said hydroxyl groups is from about 1/0.01 to about 1/3 (column 7, lines 18-26) and reads on the percentages of claim 15. The polymerization reaction to prepare addition polymer may be initiated by thermal decomposition of an initiator (column 5, lines 6-8).

Arkens et al is silent with respect to reacting the product obtained with at least one epoxy compound and subsequently reacting with polyisocyanate; and the polymerization initiator.

However, Rockrath et al teach binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent (abstract). For thermally sensitive substrates it is advantageous to choose a temperature range which does not exceed 100^0C. In view of these temperature conditions, hydroxyl groups and isocyanate groups or carboxyl and epoxy groups have proven advantageous as complimentary functional groups (column 8, lines 54-59). Therefore, it would have been obvious to one skilled in the art at the time invention was made to add polyisocyanate as a crosslinking agent to the binder of Arkens et al after reacting with epoxy crosslinker because the binder of Arkens et al comprises both carboxyl and hydroxyl groups and Rockrath et al have proven successfully that carboxyl and epoxy or hydroxyl and isocyanato are advantageous as complimentary functional groups in the binder for curing at low temperatures and one of ordinary skill in the art would expect such crosslinkers to work for the binder of Arkens et al, motivated by expectation of success.

With respect to polymerization initiator, Rockrath et al further teach that, as copolymerization initiator it is preferred to use initiators which form free radicals such as dialkyl peroxides, azobisisobutyronitrile and others (column 10, lines 66-67; column 11, lines 1-12). The strength and amount of initiator are customarily chosen in such a way that the supply of free radicals is constant. Therefore, it would have been obvious to one skilled in the art at the time of invention to use the free radical initiators of Rockrath et al in an amount (as in present claims) that provides constant supply of free radicals during

polymerization because Arkens et al contemplate using thermal initiator, known in the art, during polymerization of addition polymer and Rockrath provides list of thermal initiators that can be used in amounts that generate constant supply of free radicals during polymerization, motivated by expectation of success.

6. Claims 10-11, 13-14, 17-18 and 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockrath et al (WO 01/12736).

It is noted that WO 01/12736 (WO) is being utilized for date purposes. However, the US equivalent for WO, namely, Rockrath et al (US 6, 835, 420 B1) is referred to in the body of rejection below. All column and line citations are to the US equivalent.

Rockrath et al disclose a coating material which contains binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent. The binding agent contains in an integrally polymerized form, at least one olefinically unsaturated polysiloxane macromonomer which contains at least 3.0 double bonds per molecule (abstract). Examples of crosslinking agents (B) disclosed do not include monomers but are polymeric in nature i.e. polyisocyanates, polyepoxides (col. 2, lines 38-41). Examples of suitable binders include acrylate copolymers (column 9, lines 12-15). Preferred acrylate copolymers (column 9, line 28) prepared by polymerizing polysiloxane macromonomer i.e. m3 (column 9, line 38) have a number average molecular weight of from 1500 to 10,000 (column 9, lines 48-49) and reads on multifunctional macromonomer and its molecular weight in present claims. The olefinically unsaturated double bonds of the polysiloxane macromonomers for inventive use are present in acrylic, methacrylic, vinyl, and/or allyl groups (column 7, lines 21-22). The monomer mixture is polymerized with

one or more polymerization initiators (column 10, lines 61-63) and includes dialkyl peroxides, t-butyl perethylhexanoate and azobisisobutyronitrile (column 11, lines 5-11). Suitable substrates include glass fibers, textiles, wood, leather, building material and rock wool (column 19, lines 33-40). See example 1, wherein the coating composition comprises hexaacrylate-functional polysiloxane macromonomer in the monomer mixture and initiator solution of t-butyl perethylhexanoate in amount of about 2% by weight relative to the monomer content (column 24, lines 16-44). Binder contains on average more than 3.0 double bonds per molecule, a fraction of up to 15% by weight and preferably up to 2% by weight, based on the binder (column 7, lines 59-63) which reads on double bond content and polymerizable mixture. The polymerization takes place at temperatures between 100 and 160^{0}C (column 10, lines 64-65). Higher crosslinking temperatures may be employed and include temperatures of from 100^{0}C to 180^{0}C (column 8, lines 66-67). It is the examiner's position that coating composition consisting of binding agent and thermal initiators when cured would bind the fibrous and/or granular substrates such as glass fibers, textiles, wood, leather, building material and rock wool.

Rockrath et al is silent with respect to polymerizable mixture comprising radical polymerization initiator; impregnating the substrate with thermally polymerizable mixture and its amount.

However, Rockrath in the general disclosure teaches that the coating material may comprise at least one thermal crosslinking initiator (E). These initiators form free radicals which start the crosslinking reaction i.e. curing of the coating composition. Examples of thermal free-radical initiators are organic peroxides, peroxide esters and hydroperoxides, azo dinitriles in amounts of from 0.1 to 10% (col. 16, lines 19-27) which read on the free radical polymerization initiator of instant claims. Thermal curing takes

place at temperatures of up to about 180^{0}C if the substrates used have high thermal load bearing capacity (col. 21, lines 28-42). Therefore, it would have been obvious to one skilled in art at the time invention was made to add the thermal initiator, such as organic peroxides, to the coating composition consisting of acrylate polymer binder having about 3.0 double bonds per molecule because Rockrath teaches in the general disclosure that initiators which generate free-radicals can be used for thermally curing the coating composition consisting of binding polymer having 3.0 double bonds and one skilled in art at the time invention was made would expect addition of free radical initiators to the coating composition, under thermal curing conditions, to polymerize the double bonds of acrylic polymer.

With respect to impregnation of substrate with thermally polymerizable mixture and its amount, it is the examiner's position that impregnation of substrate with thermally polymerizable mixture in amounts of from 2 to 35% by weight and 5 to 25% by weight is dependent on adhesion desired and the fibrous and/or granular nature of substrate and is within the scope of one skilled in the art, absent evidence of unexpected results.

Response to Arguments

7. Rejection of claims 10 and 15 under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5, 096, 938) as evidenced by Fujioka et al (JP 60-163914); and claim 16 under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5, 096, 938) in view of Rockrath et al (US 6, 835, 420 B1) is being withdrawn as being cumulative in nature.

8. Applicant's arguments with respect to rejection of claims 10-11, 13-18, 20-25 and 27 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement have been considered but are moot in view of the new ground(s) of rejection set forth in paragraph 3 above.

9. Applicant's arguments with respect to rejection of claims 10-11, 13-14 and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213); claims 15-18 under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213) in view of Rockrath et al (US 6, 835, 420 B1); and claims 10-11, 13-14, 17-18 and 20-27 under 35 U.S.C. 103(a) as being unpatentable over Rockrath et al (WO 01/12736), have been considered but are moot in view of the new ground(s) of rejection.

   While the grounds of rejection are changed, it is still deemed appropriate to address some of the arguments which would be pertinent to new grounds of rejection set forth in this office action (See paragraph 10 below).

10. Applicant's arguments filed 4/29/2009 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) it is not true that the addition polymer must contain ethylenically unsaturated carboxylic acid and anhydride groups or that the monomers used in Arkens contain at least one polymerizable double bond; (B) the formed addition polymer in most of Arkens examples is polyacrylic acid and contains little, if any, residual or unreacted ethylenically double bonds; (C) no reasonable basis exists for the polyacid polymer to contain from 0.1 to 1.0 moles of unreacted residual double bonds per 100 g of polymer; (D) applicant's claimed methods are closed to monomers other than the multifunctional macromonomer and therefore exclude the

mandatory polyol component; (E) Rockrath's fibrous substrates are not fibrous and/or granular which may be impregnated and/or coated; (F) in Rockrath, there is no curing to bind the fibrous and/or granular substrates together; (G) In copolymerized form the polysiloxane macromonomer no longer contains free radically polymerizable groups; (H) Rockrath's thermocuring reactions do not involve the polymerization of unsaturated monomers is evident from the advantageously low thermocuring temperatures; (I) If thermally curable material comprising binder (A) retains a certain amount of double bonds as functional groups, Rockrath's thermally curable material requires a crosslinking agent with corresponding functional groups i.e. a monomer other than the multifunctional macromonomer, which applicant's thermally polymerizable mixture excludes.

With respect to (A), applicant's attention is drawn to Arkens et al (col. 4, lines 1-20), wherein the list of monomers used to form the addition polymer include acrylates and methacrylates. One skilled in art would recognize these monomers as ethyenically unsaturated monomers i.e. contain at least one polymerizable double bond.

With respect to (B), examiner did the Graham v. Deere analysis and provided the motivation to coat the substrate prior to complete polymerization in the rejection set forth in paragraph 4 above and is incorporated here by reference.

With the respect to (C), limitations are not required in the rejection of claims set forth in paragraph 4 above using the prior art reference of Arkens et al.

With respect to (D), applicant's attention is drawn to Arkens et al (column 7, lines 5-9) wherein it states "in one embodiment the carboxyl or anhydride-containing additional polymer, the polyol and the phosphorus-containing accelerator may be present in the same addition polymer". Thus, it is the examiner's position that polyol is

part of the multifunctional macromonomer and the macromonomer is only required to have at least one free-radically polymerizable group.

With respect to (E), it is the examiner's position that glass fibers, textiles, wood, leather, building material and rock wool are all either fibrous or granular in nature.

With respect to (F), contrary to applicant's argument the composition of Rockrath is a curable composition consisting of a binder. Thus, it is the examiner's position that when the coating composition is cured, it will bind the fibrous and/or granular substrates taught in the general disclosure.

With respect to (G) Rockrath in general disclosure teaches that the coating composition may comprise other crosslinking initiators which form free radicals (col. 16, lines 19-27). Therefore, it is the examiner's position that the binder of Rockrath in fact contains polymerizable double bonds in amounts of 3.0 double bonds per macromonomer and these double bonds would undergo polymerization in the presence of thermal crosslinking initiator which generates free radicals.

With respect to (H), applicant's attention is drawn to col. 21, lines 28-42, wherein it states that the thermal curing temperatures can be as high as 180^0C if the substrates used have a high thermal load bearing capacity. This thermal curing temperature in combination with the fact that thermal initiators generate free radicals and acrylic polymer has at least 3.0 double bonds per macromonomer would lead one skilled in the art to expect polymerization to occur.

With respect to (I), applicant's attention is drawn to col. 12, lines 38-41 wherein Rockrath et al teach that polyisocyanates and/or epoxides are used as crosslinking agents (B). Therefore, it is the examiner's position that crosslinking agents (B) do not require double bonds and it is the functional groups “a1” and “b1” on acrylic polymer and

crosslinking agent that interact. For e.g., Rockrath teaches that hydroxyl groups and isocyanate groups or carboxyl groups and epoxy groups have proven advantageous as complementary functional groups (see col. 8, lines 57-60).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. P. R./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796